

## CLAIMS

1. A method of monitoring one or more parameters of a sample gas or vapour  
5 comprising the steps of  
measuring the humidity of the sample gas or vapour,  
providing a sensor chamber containing one or more sensors,  
adjusting the humidity in the sensor chamber to be substantially the same as  
the measured humidity of the sample gas or vapour,  
10 admitting into the sensor chamber the sample gas or vapour, and  
monitoring the output of the sensor or sensors.
2. A method as claimed in Claim 1 including measuring the humidity of the  
sample when enclosed in a sample chamber.
- 15 3. A method as claimed in Claim 1 or Claim 2 further comprising providing a  
source of gas or air at a selected humidity level and passing a flow of the said gas or  
air through the sensor chamber.
- 20 4. A method according to Claim 3 in which the step of providing a supply of  
humidified air in the sensor chamber comprises generating a stream of humidified air  
from apparatus including a first humidity sensor for sensing the humidity of the air  
generated, and control means operable to vary the humidity of the generated air  
supply and to adjust the humidity of the output air supply to be substantially equal to a  
25 predetermined humidity level entered into the control means.
5. A method according to Claim 3 or Claim 4 in which the step of adjusting the  
humidity in the sensor chamber includes measuring the humidity in the sensor  
chamber by a second humidity sensor, and varying the humidity of the said supply of

humidified air until the humidity levels measured on the first and second humidity sensors are substantially the same as the said measured humidity of the sensor chamber.

5 6. A method according to any of Claims 1 to 5 in which the step of measuring the humidity of the sample gas or vapour in the sample chamber is carried out by use of a third humidity sensor mounted for measuring the humidity in the sample chamber.

10 7. A method according to any preceding claim wherein at least one of the said sensors is an olfactory sensor.

8. Apparatus for monitoring one or more olfactory parameters of the sample gas or vapour comprising  
a measuring device for measuring the humidity of the sample gas or vapour,  
15 a device for passing humidified air through a sensor chamber containing one or more sensors, such that the humidity in the sensor chamber is adjusted to be substantially the same as the measured humidity of the sample gas or vapour,  
a valve for admitting into the sensor chamber the sample gas or vapour for monitoring one or more components or parameters by the sensor or sensors.

20 9. Apparatus as claimed in Claim 8 including a sample chamber for enclosing the sample gas or vapour.

25 10. Apparatus as claimed in Claim 8 or Claim 9 further comprising a source of gas or air at a selected humidity level and a device for passing a flow of the said gas or air through the sensor chamber.

11. Apparatus as claimed in any preceding claim wherein the sensor or sensors comprise at least one olfactory sensor.

12. Apparatus for providing a flow of humidified air having a selected humidity level, comprising:

supply means for supplying a first air stream and a second air stream to be combined together, the second air stream having a higher humidity than the first air stream,

a humidity sensor for sensing the humidity of air combined from the first and second air streams, and

control means for varying the proportions in which the first and second air streams are combined in response to a humidity level signal from the humidity sensor so as to maintain the humidity of the combined air substantially at a selected humidity.

13. Apparatus according to Claim 12 wherein the supply means comprises input means for supplying an input stream of air, and

a controllable valve for directing air from the input means to a first air flow path and to a second air flow path, the second air flow path including humidifying means for increasing the humidity of the air in the second air flow path, and the valve being controllable to vary the amount of air directed to each of the air flow paths,

the control means being arranged to control the valve in response to said humidity level signal from the humidity sensor so as to maintain the humidity of the combined air substantially at a selected humidity.

14. Apparatus according to Claim 13 in which the controllable valve has a first state arranged to direct the entire input stream of air to the first air flow path and a second state arranged to direct the entire input stream of air to the second air flow path, the control means being arranged to switch the valve between states and to vary the time periods of the two states to achieve the variation in proportion in which the first and second air streams are combined.

15. Apparatus according to Claim 13 or 14 in which the first air flow path includes a flow restrictor.

16. Apparatus according to Claim 15 when including the features of Claim 13, in which the flow restrictor is variable over a range including a restriction sufficient to balance the air flows in the first and second air flow paths.

17. Apparatus according to Claim 15 when including the features of Claim 14, in which the flow restrictor is a fixed restrictor introducing an air flow restriction approximately equal to the air flow restriction introduced by the humidifying means in the second air flow path.

18. Apparatus according to Claims 16 or 17 in which the air flow restrictor has a fixed value, or is adjusted to a value, such that the time periods of the valve in the two states differ from each other by no more than a multiple of two, when the humidity sensed by the humidity sensor is close to a required level set by the control means.

19. Apparatus according to any of Claims 12 to 18 including a mixing vessel connected to receive air from the first air stream and the second air stream, the mixing vessel having an outlet for supplying combined air to further apparatus, and the humidity sensor being mounted to sense the humidity of air in the mixing vessel.

20. Apparatus according to any of Claims 12 to 19 in which the said control means comprises a microprocessor connected to receive the said humidity level signal from the humidity sensor.

21. Apparatus according to any of Claims 12 to 20 in which the control means includes a proportional integral differential controller for controlling the valve in response to the said humidity level signal from the humidity sensor.

22. An assembly for analysing an exhalation comprising a sensor chamber including sensors for producing a profile of the odour of a sample placed in the chamber, and apparatus for providing humidified air as set out in any of Claims 12 to 5 21, the humidified air apparatus being connected to supply humidified air of a selected level of humidification to the sensor chamber.

23. An assembly according to Claim 22 including a second humidity sensor mounted to sense the humidity in the sensor chamber, and connected to supply a 10 second humidity level signal to the said control means.

24. A method of providing humidified air comprising:  
supplying a first air stream and a second air stream, the second air stream having a higher humidity than the first air stream,  
15 combining air from the two air streams,  
sensing the relative humidity of the combined air, and  
varying the proportions in which the first and second air streams are combined in response to the said sensed humidity of the combined air, in such a manner as to maintain the humidity of the combined air substantially at a selected humidity.

25. A method according to Claim 24 including  
supplying an input air stream to a controllable valve for directing air from the input air stream to a first air flow path and to a second air flow path, the valve being controllable to vary the amount of air directed to each of the air flow paths,  
20 increasing the humidity of the air in the second air flow path, and  
controlling the valve in response to the said sensed humidity of the combined air, in such a manner as to maintain the humidity of the combined air substantially at a selected humidity.

26. A method according to Claim 3 including providing the said humidified air stream by the steps set out in accordance with Claim 25.

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